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Increasing crop production in Russia and Ukraine - Regional and global impacts from intensification and recultivation

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Abstract

© 2018 The Author(s). Published by IOP Publishing Ltd. Russia and Ukraine are countries with relatively large untapped agricultural potentials, both in terms of abandoned agricultural land and substantial yield gaps. Here we present a comprehensive assessment of Russian and Ukrainian crop production potentials and we analyze possible impacts of their future utilization, on a regional as well as global scale. To this end, the total amount of available abandoned land and potential yields in Russia and Ukraine are estimated and explicitly implemented in an economic agricultural sector model. We find that cereal (barley, corn, and wheat) production in Russia and Ukraine could increase by up to 64% in 2030 to 267 million tons, compared to a baseline scenario. Oilseeds (rapeseed, soybean, and sunflower) production could increase by 84% to 50 million tons, respectively. In comparison to the baseline, common net exports of Ukraine and Russia could increase by up to 86.3 million tons of cereals and 18.9 million tons of oilseeds in 2030, representing 4% and 3.6% of the global production of these crops, respectively. Furthermore, we find that production potentials due to intensification are ten times larger than potentials due to recultivation of abandoned land. Consequently, we also find stronger impacts from intensification at the global scale. A utilization of crop production potentials in Russia and Ukraine could globally save up to 21 million hectares of cropland and reduce average global crop prices by more than 3%.

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Keywords

abandoned land, agricultural sector model, Russia, Ukraine, yield potentials

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